

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

24. (Currently Amended) A method of classifying biological specimens, said method comprising the steps of:

(a) screening each of a plurality of test specimens for a first known condition using fluorescence spectral data from said test specimen illuminated with substantially monochromatic radiation, said test specimen comprising cervical tissue; and

(b) for at least one of said plurality of test specimens for which said screening step is not determinate of said test specimen having said first known condition:

(i) processing reflectance spectral data from said test specimen using reference reflectance spectral data comprising an average amplitude for each of a plurality of wavelengths; and

(ii) classifying said test specimen based on said processed reflectance spectral data, wherein ~~an amplitude of said processed reflectance spectral data is used a~~ residual amplitude at each of said plurality of wavelengths is determined by subtracting an average amplitude of said reference reflectance spectral data from an amplitude of said reflectance spectral data of said test specimen to classify said test specimen.

25. (Cancelled).

26. (Previously Presented) The method of claim 24, wherein said first known condition is a known state of health.

27. (Previously Presented) The method of claim 26, wherein said known state of health comprises one of the conditions of normal squamous tissue, metaplasia, CIN I, CIN II, CIN III, and CIN II/III.
28. (Cancelled).
29. (Cancelled).
30. (Cancelled).
31. (Previously Presented) The method of claim 24 30, wherein step (b) comprises comparing said residual amplitude at each of said plurality of wavelengths to one or more sets of reference residual reflectance spectral data.
32. (Previously Presented) The method of claim 24, wherein step (b) comprises obtaining additional optical information from said test specimen and evaluating said additional optical information with said fluorescence spectral data and said reflectance spectral data from said test specimen to classify said test specimen.
33. (Previously Presented) The method of claim 32, wherein said additional optical information comprises video information.
34. (Previously Presented) The method of claim 32, wherein said additional optical information comprises an optical image.
35. (Canceled).
36. (Previously Presented) The method of claim 24, wherein step (b)(ii) comprises classifying said test specimen as having a known state of health.

37. (Previously Presented) The method of claim 36, wherein said known state of health comprises one of the conditions of normal squamous tissue, metaplasia, CIN I, CIN II, CIN III, and CIN II/III.

38. (Currently Amended) A system for classifying biological specimens, said system comprising:

a data collection module adapted for obtaining reflectance spectral data from each of a plurality of test specimens comprising cervical tissue; and

a computation module adapted for:

screening each of said plurality of test specimens for a first known condition using fluorescence spectral data from said test specimen illuminated with substantially monochromatic radiation; and

for at least one of said plurality of test specimens for which said screening is not determinate of said test specimen having said first known condition, processing said reflectance spectral data of said test specimen using reference reflectance spectral data comprising an average amplitude for each of a plurality of wavelengths, and classifying said test specimen based on said processed reflectance spectral data, wherein ~~an amplitude of said processed reflectance spectral data is used~~ a residual amplitude at each of said plurality of wavelengths is determined by subtracting an average amplitude of said reference reflectance spectral data from an amplitude of said reflectance spectral data of said test specimen to classify said test specimen.

39. (Canceled).

40. (Previously Presented) The system of claim 38, wherein said first known condition is a known state of health.

41. (Previously Presented) The system of claim 40, wherein said known state of health comprises one of the conditions of normal squamous tissue, metaplasia, CIN I, CIN II, CIN III, and CIN II/III.

42. (Previously Presented) The system of claim 38, wherein said data collection module obtains additional optical information from each of said test specimens, and said computation module evaluates said additional optical information with said fluorescence spectral data and said reflectance spectral data from said at least one test specimen in said classifying of said test specimen.
43. (Previously Presented) The system of claim 42, wherein said additional optical information comprises video information.
44. (Previously Presented) The system of claim 42, wherein said additional optical information comprises an optical image.
45. (Canceled).
46. (Previously Presented) The system of claim 38, wherein said classifying step comprises classifying said test specimen as having a known state of health.
47. (Previously Presented) The system of claim 46, wherein said known state of health comprises one of the conditions of normal squamous tissue, metaplasia, CIN I, CIN II, CIN III, and CIN II/III.
48. (Canceled).
49. (Previously Presented) The method of claim 24, wherein step (a) comprises screening each of said test specimens for normal squamous tissue and metaplasia using said fluorescence spectral data.
50. (Previously Presented) The method of claim 24, wherein step (b) comprises using said reflectance spectral data to determine whether said test specimen is indicative of CIN

I, CIN II, CIN III, or CIN II/III in the event said fluorescence spectral data is not determinate.

51. (Previously Presented) The method of claim 24, wherein each of said test specimens is *in vivo*.

52. (Previously Presented) The method of claim 24, wherein step (b) comprises classifying said test specimen based at least in part on said processed reflectance spectral data and said fluorescence spectral data.

53. (New) The method of claim 24, wherein step (b)(ii) further comprises computing a metric from said processed reflectance spectral data to classify said test specimen based on a classification rule.

54. (New) The method of claim 53, wherein the metric comprises a Mahalanobis distance.

55. (New) The method of claim 54, wherein the classification rule is that the condition of said test specimen is assigned as the condition corresponding to the reference spectrum constellation having the shortest Mahalanobis distance, provided the shortest Mahalanobis distance is less than a predetermined minimum distance.

56. (New) The method of claim 54, wherein the classification rule is that the condition of said test specimen is indeterminate if no Mahalanobis distance is less than a predetermined minimum distance.